



Munition Suite for Multi-Role Armament and Ammunition Suite (MRAAS)



Firepower Symposium

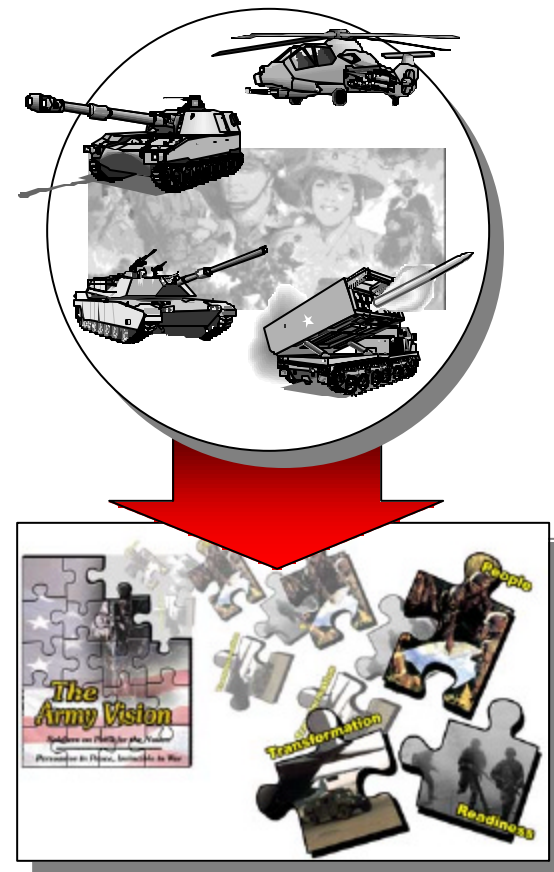
June 19, 2002

Presented by:
Matthew Cilli



CSA Announces Army Vision

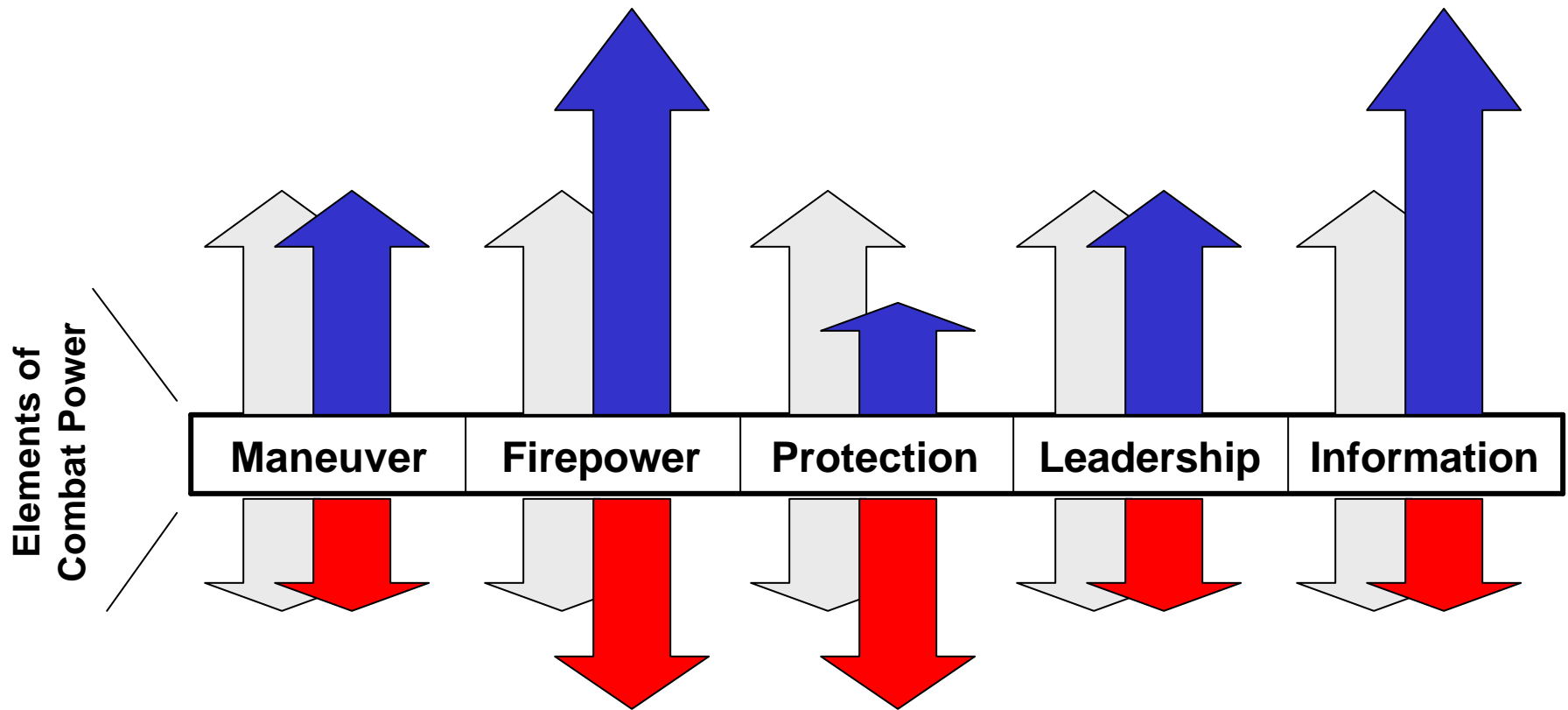
- **US Landpower – Best in the World**
 - Designed in '70s & '80s for the Cold War
 - Clearly defined enemy, forward deployment, robust infrastructure
 - Enabled use of heavy armor
- **Environment Changing**
 - US forces now primarily CONUS based
 - Rapid response required – ill-defined threat
 - Future adversaries may focus on anti-access
 - Infrastructure (bridges, roadways, etc.) varied
- **Change Impacts Design**
 - Improved deployability & ease of sustainment
 - Lighter weapons



Army Vision clearly identifies the need for change.



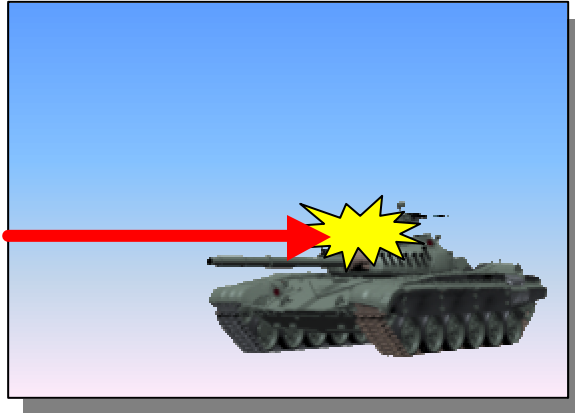
Maintaining Effectiveness Through Change



Increased firepower is required to help compensate for reduced passive armor.



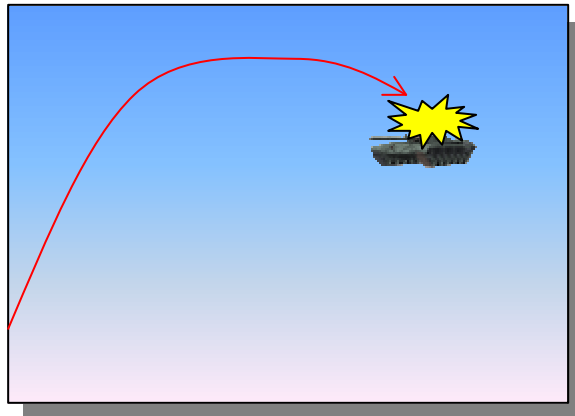
MRAAS Vision



- **LOS**

Robust Simplicity...

- Fight and survive w/o perfect situational understanding
- Lethal right out of tube
 - Inherent accuracy
 - High velocity



- **BLOS & NLOS**

State-of-the art sophistication...

- Precision munitions to extend lethal reach beyond effective standoff of enemy – improved survivability

A unique marriage of robust simplicity and state-of-the-art precision.



Munition Suite

MRAAS Munition Suite

Advanced KE (unguided)



Smart Suite

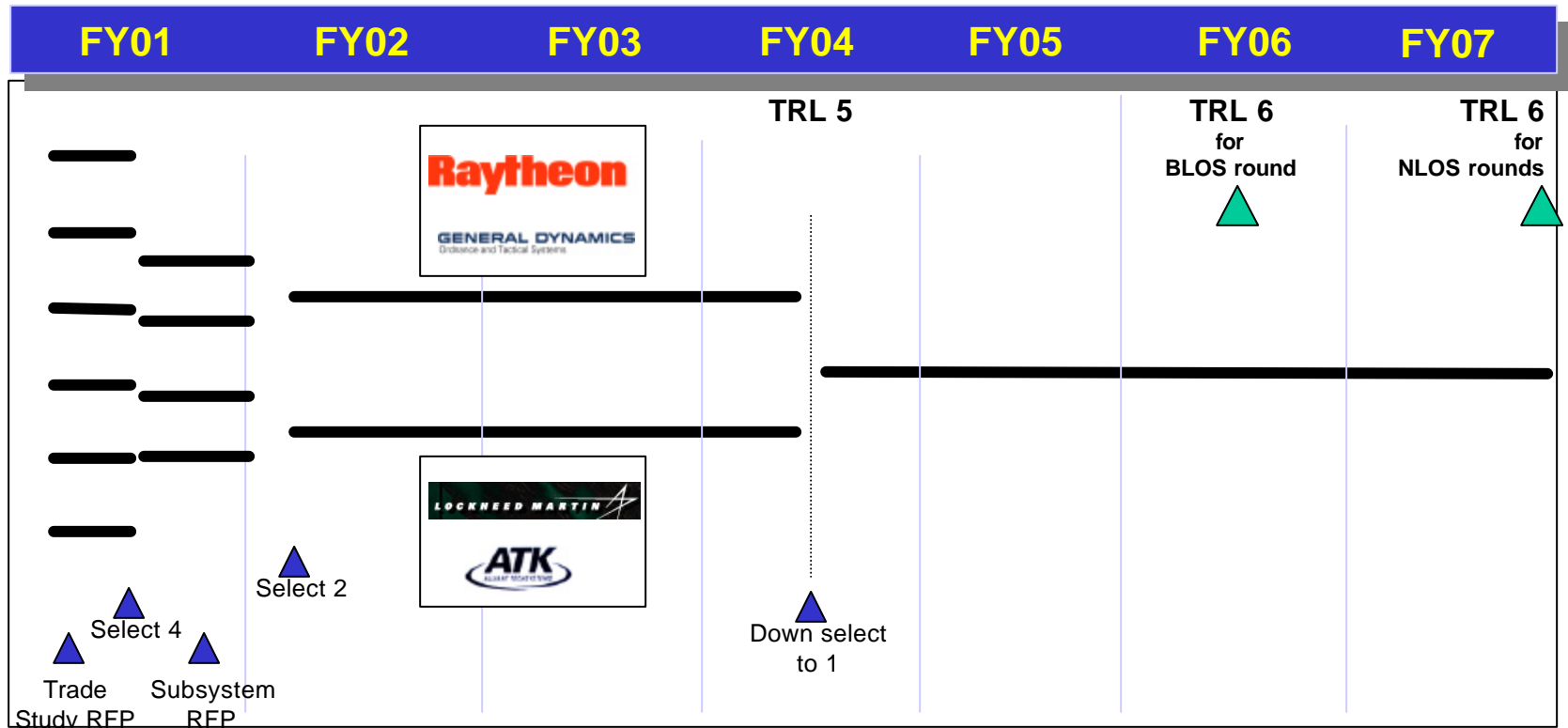


- **Objective**
 - Mature the concept and technology for a small family of munitions capable of defeating the full target spectrum beyond enemy stand-off and to prepare this small family of rounds for transition to SDD.
- **Representative Targets (prioritized list)**
 - Tanks
 - Rocket Artillery
 - SP Tube Artillery
 - APCs
 - Towed Tube Artillery
 - Infantry in Buildings
 - Infantry in Open
 - Air Defense Weapons
 - Attack UAVs
 - Attack Helicopters
 - Long Range Rocket Artillery

MRAAS aims to efficiently defeat these targets - representative of the full threat spectrum – in most cases up to and just beyond effective enemy standoff.



MRAAS Smart Suite Top Level Program



Two competing suites. Downselect in April 2004. Guide to hit demo for BLOS round in April 2006.



MRAAS Smart Suite

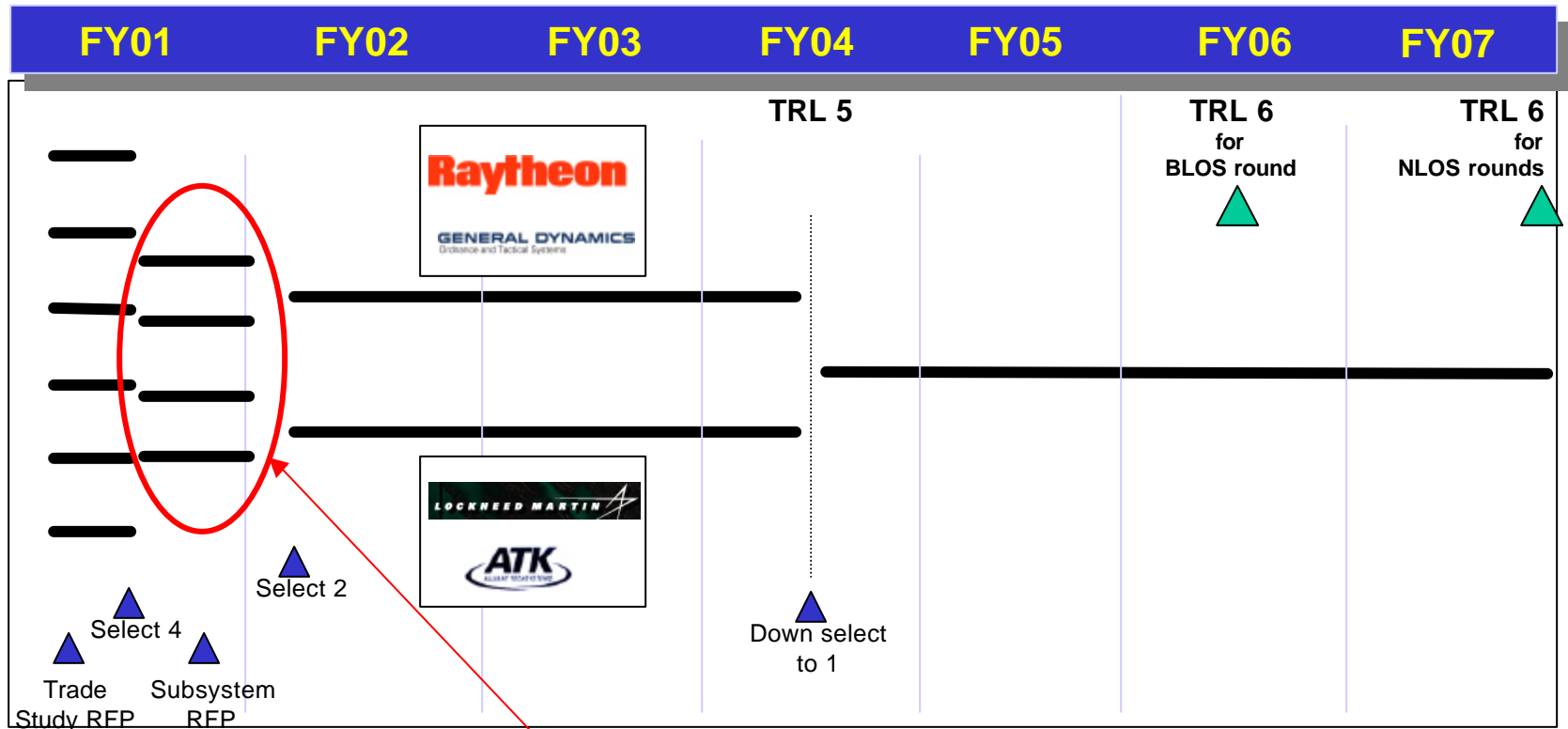
- **Two Competing Suites**
 - Raytheon w/ GDOTS
 - Lockheed Martin w/ ATK
- **Both suites have 3 rounds**
- **Competitive nature of current program prohibits disclosure of any details in this forum.**



Two very capable teams have generated compelling suite concepts.



MRAAS Smart Suite Top Level Program



A brief look follows...

Robust concept generation effort conducted in FY2001 via a five month trade study with four industry partners.



Decision Matrix

Alternatives	Lethality	Lethality in Difficult Environment	Logistics	Cost	Maturity
	Weight	5	4	2	2
	Concept A				
	Concept B				
	Concept C				

$$CSI = [\Pi(D_i^{\frac{1}{w_i}})]^{\sum w_i}$$

The overall “goodness” of a technology alternative (Customer Satisfaction Index – CSI) is a roll-up of its performance in requirement categories. Roll-up is a weighted geometric mean.

Decision matrix structures search for best value – balancing cost and performance. Note Cost is an independent variable in our decision matrix.



Comments from the Affordability Task Force

"The ATF thought that this is an excellent program that is a best practice example of how to apply affordability tools to an S&T program that focuses on balancing performance, cost, and logistics issues in an S&T environment."



**From Final Report of
Science and Technology (S&T) Affordability Program Review, June of 2001**

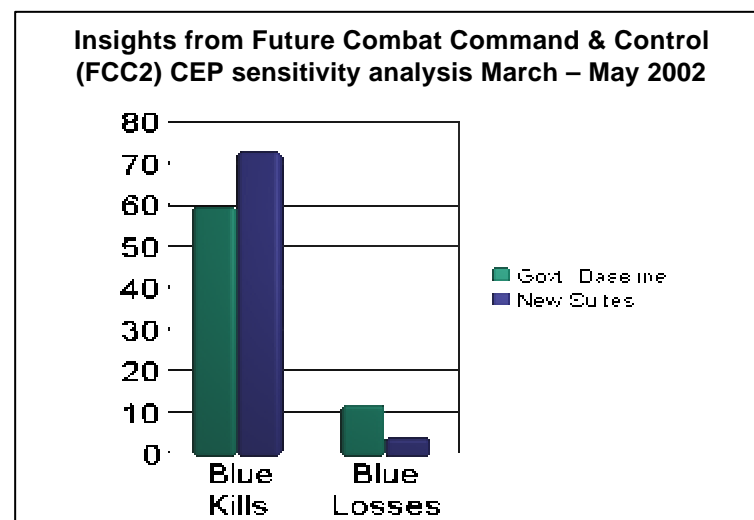
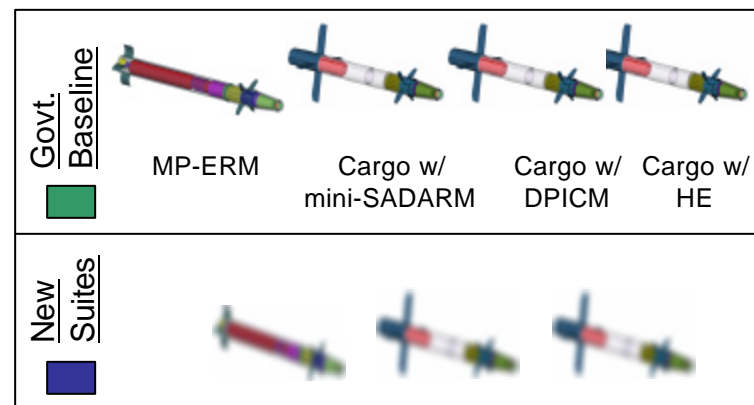
- Performance-based requirements
- Cost & logistics considered up-front with lethality
- Thresholds, goals, desirability curves
- TRADOC customer involvement
- Best value and affordability tools

Decision approach is being well-received by experts in the community.



Results

- **Suite Level Trade Space Enabled Improvement to Government Baseline**
 - Fewer rounds
 - 4 round suite vs 3 round suite
 - Positive impact on logistics
 - Positive impact on life-cycle costs
 - Reduce overly redundant capabilities
 - Ensured no capability gaps
 - Balanced risk among munitions
 - Enabled commonality considerations
 - Balanced Cost, Lethality, Maturity, Logistics.
- **Initial Insights from Future Combat Command and Control (FCC2) CEP sensitivity analysis (March – May 2002)**
 - Improved performance over Government Baseline
 - 17% increase in Blue Kills
 - 66% reduction in Blue Losses

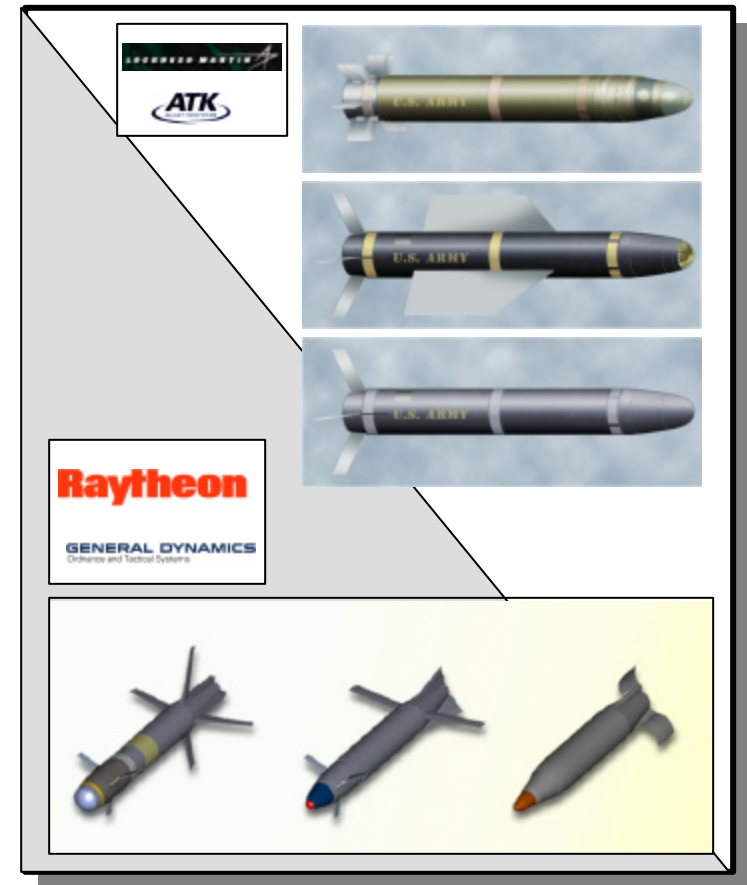


“Suite level” perspective opened up alternatives not available when constrained to 4 distinct munitions of Government Baseline.



Summary

- **Concept**
 - MRAAS concept generated in response to CSA vision
 - Precision Munitions - key element to MRAAS Concept
- **Suite Level**
 - Provides ample trade space to search for best value and encourages commonality, etc. to attack affordability hurdle.
- **Two competing suites**
 - Raytheon with GDOTS
 - Lockheed Martin with ATK



MRAAS smart suite is thoughtfully pursuing the best value solution to revolutionary firepower.